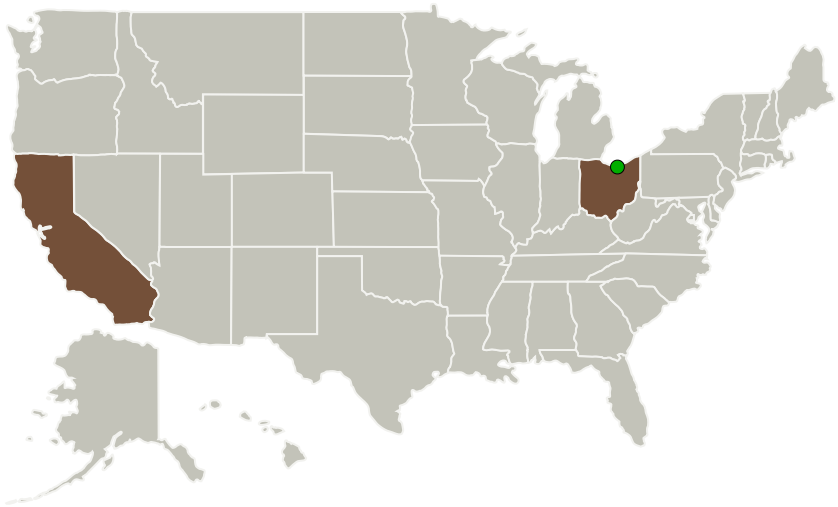
Affordable, Lightweight, Compactly Stowable, High Strength / Stiffness Lander Solar Array, Phase I

Completed Technology Project (2016 - 2016)

Project Introduction

Deployable Space Systems, Inc. (DSS) has developed a next-generation high performance solar array system specifically for NASA's future Lander and sample return missions. The proposed Lander solar array has game-changing performance metrics in terms of extremely high specific power, ultra-compact stowage volume, affordability, low risk, high environmental survivability/operability, high power and growth capability, high deployed strength and high strength during deployment (for mission environments that have high gravity and wind loading from atmospheres such as Mars), high deployed stiffness, high reliability, retraction and re-deployment capability, and broad modularity / adaptability to many missions. The proposed innovation is a tensioned membrane blanket solar array that stows very compactly with no auxiliary components extending beyond the stowed volume envelope of the stowed flexible blanket assembly, and when deployed becomes structurally pre-tensioned to create a deployed rigid body tensegrity-like configuration that exhibits very high deployed strength and stiffness. The proposed technology innovation significantly enhances Lander and sample return vehicle capabilities through its enabling performance and by providing a low cost alternative renewable power generating system in place of the very expensive standard RTG systems currently being used. The proposed innovation greatly increases performance and autonomy/mobility, decreases risk, and ultimately enables missions.

Primary U.S. Work Locations and Key Partners



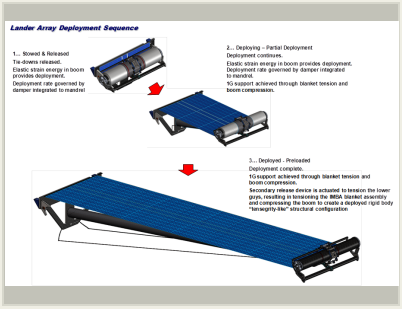


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Table of Contents

Small Business Innovation Research/Small Business Tech Transfer

Affordable, Lightweight, Compactly Stowable, High Strength / Stiffness Lander Solar Array, Phase I

Completed Technology Project (2016 - 2016)

Organizations Performing Work	Role	Type	Location
Deployable Space Systems, Inc(DSS)	Lead Organization	Industry	Goleta, California
Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations	
California	Ohio

Project Transitions

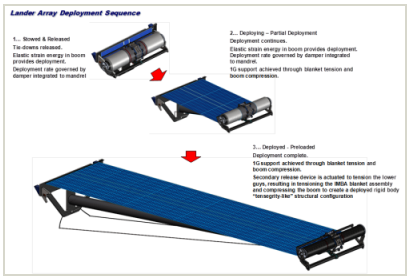
June 2016: Project Start

December 2016: Closed out

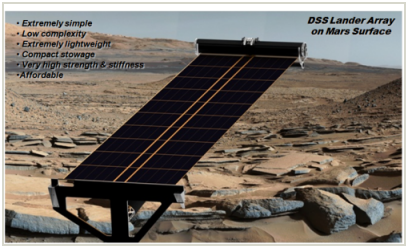
Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/139581)*

Images



Briefing Chart Image
Affordable, Lightweight, Compactly Stowable, High Strength / Stiffness Lander Solar Array, Phase I *(https://techport.nasa.gov/image/126141)*



Final Summary Chart Image
Affordable, Lightweight, Compactly Stowable, High Strength / Stiffness Lander Solar Array, Phase I Project Image *(https://techport.nasa.gov/image/134171)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Deployable Space Systems, Inc (DSS)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

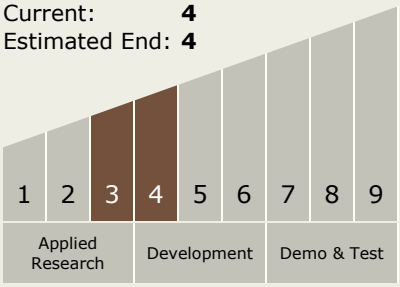
Carlos Torrez

Principal Investigator:

Brian R Spence

Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



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Completed Technology Project (2016 - 2016)

Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
  - TX03.1 Power Generation and Energy Conversion
    - TX03.1.1 Photovoltaic

Target Destinations

Earth, The Moon, Others Inside the Solar System, Outside the Solar System, The Sun, Mars